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     (FILE 'HOME' ENTERED AT 13:22:12 ON 14 JAN 2004)
                SET COST OFF

     FILE 'HCAPLUS' ENTERED AT 13:22:26 ON 14 JAN 2004
L1         21509 S LEWIS ACID
L2         10765 S L1 (L) CATALY?
                 E LEWIS ACID/CT
L3          2444 S E8 (L) CATALY?
L4          2999 S E8 (L) CAT/RL
                 E CATALYST/CT
L5           100 S E14 (L) LEWIS ACID
L6          2526 S L1 AND CATALY?/SC,SX
L7         11685 S L2-L6
                 E KOBAYASHI S/AU
L8             7 S E3,E4 AND L7
                 E KOBAYASHI SHU/AU
L9            99 S E3-E5 AND L7
L10          100 S KOBAYASHI SHU?/AU AND L7
L11            1 S (WO2000-JP7386 OR JP99-327424)/AP,PRN
L12          107 S L8-L10
L13           71 S L7 AND (SO3 OR SO4)
L14            0 S L12 AND L13
L15            1 S L11 AND L13
L16          331 S L7 AND (SULFATE OR SULPHATE OR SULFONATE OR SULPHONATE)
L17           10 S L12 AND L16
L18          323 S L7 AND (?SULFATE? OR ?SULPHATE? OR ?SULFONATE? OR ?SULPHONATE
L19           24 S L12 AND (?SULFATE? OR ?SULPHATE? OR ?SULFONATE? OR ?SULPHONAT
                 SEL DN AN 7 17
L20            2 S L19 AND E1-E4
L21            3 S L15,L20 AND L1-L20
L22          118 S L7 AND CARBON CARBON
L23          159 S L7 AND C C
L24          259 S L22,L23
L25           13 S L24 AND ?LANTHAN?
L26          294 S L7 AND ?LANTHAN?
L27           12 S L16,L18 AND L24
L28            2 S L16,L18 AND L25
L29           51 S L16,L18 AND L26
L30         3166 S L7 AND ?POLYM?
L31         2050 S L7 AND POLYM?/SC,SX
L32         3337 S L30,L31
L33           12 S L32 AND L13
L34          164 S L32 AND L16,L18
L35          168 S L33,L34
L36            1 S L35 AND L24
L37           17 S L35 AND ?LANTHAN?

     FILE 'REGISTRY' ENTERED AT 13:40:39 ON 14 JAN 2004
L38            1 S 10361-84-9

     FILE 'HCAPLUS' ENTERED AT 13:40:50 ON 14 JAN 2004
L39          434 S L38
L40          733 S SCCL3 OR SCANDIUM CHLORIDE
L41          849 S L39,L40
L42           30 S L41 AND L7
L43           69 S L41 AND ?POLYM?
L44           30 S L41 AND POLYM?/SC,SX
L45           74 S L43,L44
L46           13 S L45 AND (SO3 OR SO4 OR ?SULFATE? OR ?SULPHATE? OR ?SULPHONATE
L47            1 S L45 AND (C C OR CARBON CARBON)
L48           13 S L46 NOT L47
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L49          4 S L46 AND SUPPORT?

     FILE 'REGISTRY' ENTERED AT 13:45:44 ON 14 JAN 2004
L50          1 S 9003-70-7
L51          1 S 100-42-5
L52      66029 S 100-42-5/CRN
L53         17 S L52 AND 1/NC
L54         13 S L53 NOT RIS/CI
L55          3 S L54 AND HOMOPOLYMER

     FILE 'HCAPLUS' ENTERED AT 13:47:54 ON 14 JAN 2004
L56     158672 S L50,L51,L55
L57        352 S L56 AND L7
L58          2 S L57 AND L41
L59         26 S L57 AND L16,L18
L60          1 S L59 AND (C C OR CARBON CARBON)
L61          9 S L57 AND ?LANTHAN?
L62         33 S L58,L59,L60,L61
L63         64 S L12 AND L13-L37,L39-L49,L56-L62
L64          8 S L63 AND ?SUPPORT?
L65          8 S L63 AND ?POLYM?
L66          8 S L64,L65
L67          7 S L66 NOT ENOL/TI
L68         56 S L63 NOT L66
               SEL DN AN L68 14 22 27 29
L69          4 S L68 AND E5-E16
L70         12 S L67,L69,L15
               E POLYMER SUPPORT/CT
               E POLYMER-SUPPORT/CT
               E E5+ALL
L71        249 S E2
               E POLYMER-SUPPORT/CT
               E E7+ALL
L72       2842 S E4
L73         53 S L71,L72 AND L7
L74         14 S L73 AND ?METAL?
L75          1 S L73 AND ?LANTHAN?
               SEL DN AN L74 3 7 9 11 13 14
L76          6 S L74 AND E1-E18
L77         17 S L70,L76
L78          6 S L77 AND (SO3 OR SO4 OR ?SULFATE? OR ?SULPHATE? OR ?SULPHONATE
L79         14 S L70,L78
L80          7 S L12 AND L41
L81         14 S L79 AND L1-L37,L39-L49,L56-80

=> fil hcaplus
FILE 'HCAPLUS' ENTERED AT 14:18:11 ON 14 JAN 2004
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
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FILE COVERS 1907 - 14 Jan 2004 VOL 140 ISS 3

FILE LAST UPDATED: 13 Jan 2004 (20040113/ED)

This file contains CAS Registry Numbers for easy and accurate
substance identification.

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L81 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:812038 HCAPLUS
DN 136:183375
ED Entered STN: 08 Nov 2001
TI New methods for high-throughput synthesis
AU **Kobayashi, Shu**; Akiyama, Ryo
CS Graduate School of Pharmaceutical Sciences, The University of Tokyo,
Tokyo, 113-0033, Japan
SO Pure and Applied Chemistry (2001), 73(7), 1103-1111
CODEN: PACHAS; ISSN: 0033-4545
PB International Union of Pure and Applied Chemistry
DT Journal
LA English
CC 21-2 (General Organic Chemistry)
AB New methodologies for library synthesis have been developed. They are based on new **carbon-carbon** bond-formation reactions in the solid-phase and organic synthesis using **polymer-supported** catalysts. Alkyl glyoxylate equivalent was immobilized onto resins and novel **polymer-supported** imines were prepared Unprecedented **polymer-supported** catalysts such as microencapsulated scandium **trifluoromethanesulfonate** [MC Sc(OTf)3], osmium tetroxide (MC OsO4), and palladium triphenylphosphine [MC Pd(PPh3)] for high-throughput synthesis have been developed. A lecture presented at the 38th IUPAC Congress/World Chemical Congress held 1-6 July 2001 in Brisbane, Australia.
ST combinatorial chem high throughput lecture; imino acetate combinatorial chem high throughput lecture; scandium microencapsulated **polymer** immobilized lecture; osmium tetroxide microencapsulated **polymer** immobilized lecture
IT Combinatorial chemistry
(methods for high-throughput combinatorial synthesis)
IT **Lewis acids**
RL: **CAT (Catalyst use)**; CRG (Combinatorial reagent); RGT (Reagent); CMBI (Combinatorial study); RACT (Reactant or reagent); USES (Uses)
(microencapsulated, **polymer**-immobilized; methods for high-throughput combinatorial synthesis)
IT **Polymer-supported reagents**
(microencapsulated; methods for high-throughput combinatorial synthesis)
IT Imines
RL: CST (Combinatorial study, unclassified); SPN (Synthetic preparation); CMBI (Combinatorial study); PREP (Preparation)
(**polymer-supported**; methods for high-throughput combinatorial synthesis)
IT Dihydroxylation
Dihydroxylation catalysts
Hydroxylation
Hydroxylation catalysts
(stereoselective; methods for high-throughput combinatorial synthesis)
IT 12628-74-9, Palladium triphenylphosphine 20816-12-0, Osmium oxide (OsO4)
144026-79-9, Scandium triflate
RL: CAT (Catalyst use); CRG (Combinatorial reagent); RGT (Reagent); CMBI (Combinatorial study); RACT (Reactant or reagent); USES (Uses)
(microencapsulated, **polymer**-immobilized; methods for

high-throughput combinatorial synthesis)
RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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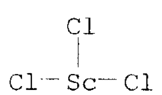
L81 ANSWER 2 OF 14 HCAPLUS
AN 2001:365950 HCAPLUS
DN 134:344942
ED Entered STN: 22 May 2001
TI **Lewis acid catalyst supported** on **polymer**
IN Kobayashi, Osamu
PA Foundation for Scientific Technology Promotion, Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM B01J031-26
ICS B01J031-12; B01J031-14; B01J031-16; B01J031-34; B01J031-36; B01J031-38; C07B037-02; C07C029-40; C07C033-025; C07C033-30; C07C045-64; C07C049-835; C07C067-31; C07C069-732; C07C253-00; C07C255-42; C07C327-22; C07B061-00; C07D263-10
CC 67-1 (**Catalysis**, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 38
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001137710	A2	20010522	JP 1999-327424	19991117 <--
	JP 3389176	B2	20030324		
	WO 2001036095	A1	20010525	WO 2000-JP7386	20001023 <--
	W: US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 1184076	A1	20020306	EP 2000-969995	20001023 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
PRAI	JP 1999-327424	A	19991117 <--		
	WO 2000-JP7386	W	20001023 <--		

AB The **Lewis acid** MXn (M = polyvalent element such as **lanthanoid** elements; X = anion; and n = integer corresponding to valency of M) is bonded to a **polymer** film (**polymer** chain) via (a) **SO3** or **SO4** or (b) a spacer mol. The **polymer** chain is made from aromatic addition **polymer**. The **catalyst** shows high **catalytic** activity in an aqueous medium,

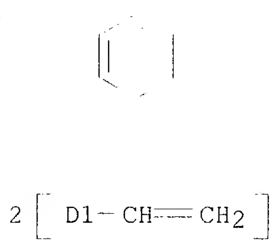
and can be recovered easily.
ST **Lewis acid catalyst polymer support**
IT **Catalyst supports**
Catalysts
(**Lewis acid catalyst supported** on **polymer**)
IT **10361-84-9**, Scandium trichloride
RL: CAT (Catalyst use); USES (Uses)
(**Lewis acid catalyst supported** on **polymer**)
IT **9003-70-7D**, Divinylbenzene-styrene **copolymer**, reaction product with 5-phenylvaleric acid chloride and scandium trichloride
RL: CAT (Catalyst use); USES (Uses)
(**catalyst support; Lewis acid catalyst supported** on **polymer**)
IT **10361-84-9**, Scandium trichloride
RL: CAT (Catalyst use); USES (Uses)
(**Lewis acid catalyst supported** on **polymer**)
RN 10361-84-9 HCAPLUS
CN Scandium chloride ($ScCl_3$) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IT **9003-70-7D**, Divinylbenzene-styrene **copolymer**, reaction product with 5-phenylvaleric acid chloride and scandium trichloride
RL: CAT (Catalyst use); USES (Uses)
(**catalyst support; Lewis acid catalyst supported** on **polymer**)
RN 9003-70-7 HCAPLUS
CN Benzene, diethenyl-, polymer with ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 1321-74-0
CMF C10 H10
CCI IDS



CM 2

CRN 100-42-5
CMF C8 H8

$H_2C=CH-Ph$

L81 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
AN **2001:201156** HCAPLUS
ED Entered STN: 22 Mar 2001
TI New types of **polymer-supported** catalysts used in organic synthesis
AU **Kobayashi, Shu**
CS Graduate School of Pharmaceutical Sciences, The University of Tokyo, Tokyo 113-0033, Japan
SO Abstracts of Papers - American Chemical Society (2001), 221st, INOR-037
CODEN: ACSRAL; ISSN: 0065-7727
PB American Chemical Society
DT Journal; Meeting Abstract
LA English
AB Development of **polymer-supported catalysts** is one of the most important tasks in organic synthesis, especially in the move towards clean and environmentally friendly chemical processes. **Polymer-supported catalysts** have advantages over monomeric **catalysts** in ease of work-up, separation of products and **catalysts**, from the economical point of view, and in application to industrial processes, etc. However, preparation of **polymer-supported catalysts** is often difficult and for most conventional methods used the activity of the **polymer-supported catalysts** is lower than that of the corresponding monomeric **catalysts**. We have developed unprecedented **polymer-supported catalysts**, microencapsulated **catalysts** such as microencapsulated scandium **trifluoromethanesulfonate** (scandium triflate) (MC Sc(OTf)3) and microencapsulated osmium tetroxide (MC OsO4). This new method for immobilizing a **catalyst** onto a **polymer** is based both on phys. envelopment by the **polymer** and on electronic interaction between p electrons of benzene rings of the **polymer** and a vacant orbital of the **Lewis acid.** Other microencapsulated **catalysts** will also be discussed in this presentation.

L81 ANSWER 4 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
AN **2000:816923** HCAPLUS
DN **134:100348**
ED Entered STN: 21 Nov 2000
TI Green **Lewis acid catalysis** in organic synthesis
AU **Kobayashi, Shu;** Manabe, Kei
CS Graduate School of Pharmaceutical Sciences, The University of Tokyo, Tokyo, 113-0033, Japan
SO Pure and Applied Chemistry (2000), 72(7), 1373-1380
CODEN: PACHAS; ISSN: 0033-4545
PB International Union of Pure and Applied Chemistry
DT Journal; General Review
LA English
CC 21-0 (General Organic Chemistry)
AB A review of the authors' work with 20 refs. New types of **Lewis acids** as water-stable **catalysts** have been developed. Metal salts such as rare earth metal triflates can be used in **carbon-carbon** bond-forming reactions in aqueous media. These salts can be recovered after the reactions and reused. Furthermore, **Lewis acid**-surfactant-combined **catalysts,** which can be used for reactions in water without using any organic solvents, have been also developed. Finally, **Lewis acid**

catalysis in supercrit. carbon dioxide has been successfully performed. These investigations will contribute to development of environmentally friendly **Lewis acid catalysis** .

ST water stable **Lewis acid catalyst** review
IT **Catalysis**
(water-stable **Lewis acid catalysis** in organic synthesis)
IT **Lewis acids**
RL: **CAT (Catalyst use)**; USES (Uses)
(water-stable **Lewis acid catalysis** in organic synthesis)
RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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(11) Kobayashi, S; Green Chemistry 1999, V1, P175 HCAPLUS
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L81 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1999:555723 HCAPLUS
DN **132:195296**
ED Entered STN: 02 Sep 1999
TI **Polymer-supported** rare earth catalysts used in organic synthesis
AU **Kobayashi, Shu**
CS Graduate School of Pharmaceutical Sciences, The University of Tokyo, Tokyo, 113-0033, Japan
SO Topics in Organometallic Chemistry (1999), 2(Lanthanides), 285-305
CODEN: TORCFV; ISSN: 1436-6002
PB Springer-Verlag
DT Journal; General Review
LA English
CC 38-0 (Plastics Fabrication and Uses)
Section cross-reference(s): 45, **67**
AB A review with 38 refs. Three types of **polymer-supported** rare earth **catalysts**, Nafion-based rare earth **catalysts**

, polyacrylonitrile-based rare earth **catalysts**, and microencapsulated **Lewis acids**, are discussed. Use of **polymer-supported catalysts** offers several advantages in preparative procedures such as simplification of product work-up, separation, and isolation, as well as the reuse of the **catalyst** including flow reaction systems leading to economical automation processes. Although the use of immobilized homogeneous **catalysts** is of continuing interest, few successful examples are known for **polymer-supported Lewis acids**. The unique characteristics of rare earth **Lewis acids** have been utilized, and efficient **polymer-supported Lewis acids**, which combine the advantages of immobilized **catalysis** and **Lewis acid**-mediated reactions, have been developed.

ST **polymer supported** rare earth **catalyst** review; Nafion rare earth **catalyst** review; polyacrylonitrile rare earth **catalyst** review; microencapsulated **Lewis acid catalyst** review

IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, catalysts; **polymer-supported** rare earth catalysts used in organic synthesis)

IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); USES (Uses)
(fluorine-containing, sulfo-containing, ionomers, catalysts; **polymer-supported** rare earth catalysts used in organic synthesis)

IT **Lewis acids**
Rare earth **metals**, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(microencapsulated, **catalysts; polymer-supported** rare earth **catalysts** used in organic synthesis)

IT **Polymer-supported reagents**
(**polymer-supported** rare earth catalysts used in organic synthesis)

IT **Fluoropolymers**, uses
Fluoropolymers, uses
RL: CAT (Catalyst use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, catalysts; **polymer-supported** rare earth catalysts used in organic synthesis)

IT Ionomers
RL: CAT (Catalyst use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing, catalysts; **polymer-supported** rare earth catalysts used in organic synthesis)

IT 25014-41-9, Polyacrylonitrile
RL: CAT (Catalyst use); USES (Uses)
(catalysts; **polymer-supported** rare earth catalysts used in organic synthesis)

RE.CNT 92 THERE ARE 92 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L81 ANSWER 6 OF 14 HCAPLUS
AN **1999:555717** HCAPLUS
DN **131:213773**
ED Entered STN: 02 Sep 1999
TI **Lanthanide** triflate-catalyzed **carbon-carbon** bond-forming reactions in organic synthesis
AU **Kobayashi, Shu**
CS Graduate School of Pharmaceutical Sciences, The University of Tokyo, Tokyo, 113-0033, Japan
SO Topics in Organometallic Chemistry (1999), 2(Lanthanides), 63-118
CODEN: TORCFV; ISSN: 1436-6002
PB Springer-Verlag
DT Journal; General Review
LA English
CC 21-0 (General Organic Chemistry)
AB Versatile **C-C** bond-forming reactions using **lanthanide** triflates (Ln(OTf)3) as **catalysts** are discussed. **Lanthanide** triflates are new types of **Lewis acids** different from typical **Lewis acids** such as AlCl3, BF3, SnCl4, etc. While most **Lewis acids** are decomposed or deactivated in the presence of H2O, **lanthanide** triflates are stable and work as **Lewis acids** in water solns. Many N-containing compds. such as imines and hydrazones are also successfully activated by using a small amount of Ln(OTf)3. **Lanthanide** triflates are also excellent **Lewis acid catalysts** in organic solvents. A **catalytic** amount of Ln(OTf)3 is enough to complete reactions in most cases. Ln(OTf)3 can be recovered after reactions are completed and can be reused. Several chiral **lanthanide catalysts** for asym. Diels-Alder, aza Diels-Alder, and 1,3-dipolar cycloaddn. reactions are also described. A review with 107 refs.
ST review **lanthanide** triflate catalyst; **carbon carbon** bond formation review
IT Bond
(**carbon-carbon; lanthanide** triflate-catalyzed **carbon-carbon** bond-forming reactions in organic synthesis)
IT Bond formation
(**lanthanide** triflate-catalyzed **carbon-carbon** bond-forming reactions in organic synthesis)
IT Rare earth compounds
RL: CAT (Catalyst use); USES (Uses)
(**lanthanide** triflate-catalyzed **carbon-carbon** bond-forming reactions in organic synthesis)
RE.CNT 191 THERE ARE 191 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L81 ANSWER 7 OF 14 HCAPLUS
AN 1999:529153 HCAPLUS
DN 131:144192
ED Entered STN: 24 Aug 1999
TI Preparation of microencapsulated **Lewis acid** for improved **catalyst** performance
IN **Kobayashi, Shu**
PA Japan Science and Technology Corporation, Japan
SO PCT Int. Appl., 27 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
IC ICM C07F005-00
ICS B01J013-02; C07C225-16; C07C069-732; C07C069-738; C07C049-84; C07C033-30; C07C255-31; C07C255-42; C07C211-45; C07D491-048; C07D263-26
CC 21-2 (General Organic Chemistry)
Section cross-reference(s): 25, 27, 28
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9941259	A1	19990819	WO 1999-JP626	19990212
	W: CN, JP, KR, SG, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 1069127	A1	20010117	EP 1999-903915	19990212
	R: DE, FR, GB, IT, NL				
	US 6352954	B1	20020305	US 2000-622196	20000925
PRAI	JP 1998-31880	A	19980213		
	WO 1999-JP626	W	19990212		

OS CASREACT 131:144192
AB Disclosed is a microencapsulated **Lewis acid** characterized in that the **Lewis acid** has been **supported** through coordinate bonds on microcapsules of an organic **polymer**. The acid is a novel **polymer-supported** **Lewis acid** which exhibits high activity, maintains activity in repeated usage, and exceeds the tech. limit to conventional **polymer-supported catalysts** and eliminates the problems in **Lewis acid catalysts**, which are significantly industrially useful, concerning preparation of a reaction system, **catalyst** separation from a reaction product, and **catalyst** recovery. Thus, coacervation-induced microencapsulation of scandium triflate, Sc(OTf)3, was effected by adding 0.200 g Sc(OTf)3 to a solution of 1.00 g polystyrene (weight average mol. weight 280,000) dissolved in 20 mL cyclohexane at 40°, stirring the resulting mixture at 40° for 1 h, slowly cooling the mixture to 0° which resulted in phase separation (coacervation) and coating of Sc(OTf)3 with polystyrene, and adding hexane for hardening particle walls of microcapsules and stirring for another 1 h, and washing microcapsule particles with MeCN and during to give Sc(OTf)3 **supported** on microcapsules (I). The latter polystyrene-microencapsulated Sc(OTf)3 was evaluated as a **catalyst** for aldol condensation of aldehyde or aldimine with silyl enolate, Michael addition, Friedel-Crafts acetylation, addition of tetrallyltin to benzaldehyde or benzaldehyde N-phenylimine, cycloaddn. of N-propenoyl-2-oxazolidinone

to cyclopentadiene or 2,3-dihydropyran, or addition of trimethylsilyl cyanide to cyclohexanecarboxaldehyde or benzaldehyde N-phenylimine. For example, the **catalyst** I (1.167 g) was packed in a column (1.6 + 15 cm) through which a solution of 0.50 mmol PhCH:NPh and 0.60 mmol MeCH:CPhOSiMe3 in 15 mL MeCN was circulated for 3 h to give 90% PhCH(NHPh)CHMeCOPh (II). The **catalyst** was recovered and reused addnl. 6-times in the same reaction to give 88-90% II.

ST microencapsulated **Lewis acid** prepn; polystyrene microencapsulated scandium triflate prepn; aldol condensation **catalyst** microcapsule **supported Lewis acid**; Michael addn **catalyst** microcapsule **supported Lewis acid**; Friedel Crafts acetylation **catalyst** microcapsule **supported Lewis acid**; cycloaddn **catalyst** microcapsule **supported Lewis acid**; addn **catalyst** microcapsule **supported Lewis acid**

IT Encapsulation
(microencapsulation; preparation of microencapsulated **Lewis acid** for improved **catalyst** performance)

IT Addition reaction **catalysts**
Aldol condensation **catalysts**
Cycloaddition reaction **catalysts**
Friedel-Crafts reaction **catalysts**
Michael reaction **catalysts**
Microcapsules
(preparation of microencapsulated **Lewis acid** for improved **catalyst** performance)

IT **Lewis acids**
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of microencapsulated **Lewis acid** for improved **catalyst** performance)

IT 144026-79-9, Scandium triflate
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(microencapsulation; preparation of microencapsulated **Lewis acid** for improved **catalyst** performance)

IT **9003-53-6D**, Polystyrene, scandium triflate microencapsulated by
RL: CAT (Catalyst use); USES (Uses)
(preparation of microencapsulated **Lewis acid** for improved **catalyst** performance)

IT 144026-79-9DP, Scandium triflate, polystyrene-microencapsulated
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of microencapsulated **Lewis acid** for improved **catalyst** performance)

IT 62-53-3, Benzenamine, reactions 94-41-7, Phenyl styryl ketone 100-52-7, Benzaldehyde, reactions 100-66-3, Anisole, reactions 108-24-7, Acetic anhydride 538-51-2, Benzaldehyde N-phenylimine 542-92-7, Cyclopentadiene, reactions 1191-99-7 2043-21-2 2043-61-0, Cyclohexanecarboxaldehyde 7393-43-3, Tetraallyltin 7677-24-9, Trimethylsilyl cyanide 31469-15-5, 1-Methoxy-1-((trimethylsilyl)oxy)-2-methyl-1-propene 43108-63-0, 1-Phenyl-1-((trimethylsilyl)oxy)-1-propene
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of microencapsulated **Lewis acid** for improved **catalyst** performance)

IT 100-06-1P, 4-Acetylanisole 743-93-1P 936-58-3P, 1-Phenyl-3-buten-1-ol 4354-47-6P 4553-59-7P 35022-33-4P 58649-05-1P 66489-79-0P 173327-38-3P 208757-07-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of microencapsulated **Lewis acid** for improved **catalyst** performance)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Anon; EP 156564 A2 HCAPLUS

(2) Anon; DE 3024264 A1 HCAPLUS
(3) Anon; US 4225460 A HCAPLUS
(4) Anon; US 4503161 A HCAPLUS
(5) Anon; JP 60-223805 A HCAPLUS
(6) Kobayashi, S; J Am Chem Soc 1998, V120(12), P2985 HCAPLUS
(7) Minnesota Mining and Manufacturing Co; JP 56-10525 A 1981 HCAPLUS
(8) Minnesota Mining and Manufacturing Co; JP 06-296855 A 1994 HCAPLUS

IT **9003-53-6D**, Polystyrene, scandium triflate microencapsulated by
RL: CAT (Catalyst use); USES (Uses)
(preparation of microencapsulated **Lewis acid** for improved **catalyst** performance)
RN 9003-53-6 HCAPLUS
CN Benzene, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 100-42-5
CMF C8 H8

$H_2C=CH-Ph$

L81 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
AN **1999:29096** HCAPLUS
DN **130:66023**
ED Entered STN: 14 Jan 1999
TI Scandium triflate in organic synthesis
AU **Kobayashi, Shu**
CS Graduate School Pharmaceutical Sciences, University Tokyo, Tokyo, 113, Japan
SO European Journal of Organic Chemistry (1999), (1), 15-27
CODEN: EJOCFK; ISSN: 1434-193X
PB Wiley-VCH Verlag GmbH
DT Journal; General Review
LA English
CC 21-0 (General Organic Chemistry)
AB A review with >75 refs. Sc(OTf)3 (Tf = CF3SO2) a new type of a **Lewis acid** that is different from typical **Lewis acids** such as AlCl3,, BF3, SnCl4, etc. While most **Lewis acids** are decomposed or deactivated in the presence of water, Sc(OTf)3 is stable and works as a **Lewis acid** in water solns. Many N-containing compds. such as imines and hydrazones are also successfully activated by using a small amount of Sc(OTf)3 in both organic and aqueous solvents. In addition, Sc(OTf)3 can be recovered after reactions are completed and can be reused. While **lanthanide** triflates [Ln(OTf)3] have similar properties, the **catalytic** activity of Sc(OTf)3 is higher than that of Ln(OTf)3 in several cases.
ST review scandium triflate catalyst org synthesis
IT Catalysts
Organic synthesis
(scandium triflate for catalysis in organic synthesis)
IT **Lewis acids**
RL: **CAT (Catalyst use)**; USES (Uses)
(scandium triflate for **catalysis** in organic synthesis)
IT 144026-79-9, Scandium triflate
RL: CAT (Catalyst use); USES (Uses)
(scandium triflate for catalysis in organic synthesis)
RE.CNT 169 THERE ARE 169 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L81 ANSWER 9 OF 14 HCAPLUS
AN **1998:647064** HCAPLUS
DN **130:25083**
ED Entered STN: 14 Oct 1998
TI **Lanthanides** in aqueous-phase catalysis
AU **Kobayashi, Shu**
CS Dep. Appl. Chem., Fac. Sci., Sci. Univ. Tokyo, Kagurazaka, Shinjuku-u, Tokyo, 162, Japan
SO Aqueous-Phase Organometallic Catalysis (1998), 519-528. Editor(s): Cornils, Boy; Herrmann, Wolfgang A. Publisher: Wiley-VCH Verlag GmbH, Weinheim, Germany.
CODEN: 66TTAW
DT Conference; General Review
LA English
CC 29-0 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 21, **67**
AB **Lanthanide** triflates are stable **Lewis acids** in water and are successfully used in several **carbon-carbon** bond forming reactions in aqueous solns. The reactions proceed

smoothly in the presence of a **catalytic** amount of the triflate under mild conditions. The **catalysts** can be recovered after the reactions are completed and can be re-used. **Lewis acid catalysis** in micellar systems will lead to clean and environmentally friendly processes. A review with 35 refs.

ST review **lanthanide** aq phase catalysis

IT Phase transfer catalysts
(**lanthanide** triflates as aqueous-phase catalysts)

IT Rare earth compounds
RL: CAT (Catalyst use); USES (Uses)
(triflates; aqueous-phase catalysts)

RE.CNT 60 THERE ARE 60 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L81 ANSWER 10 OF 14 HCAPLUS
AN 1998:315176 HCAPLUS
DN 129:4244
ED Entered STN: 28 May 1998
TI **Catalytic** activation of imine derivatives using novel **Lewis acids**
AU **Kobayashi, Shu**; Ishitani, Haruro
CS Fac. Sci., Sci. Univ. Tokyo, Tokyo, 162-8601, Japan
SO Yuki Gosei Kagaku Kyokaishi (1998), 56(5), 357-367
CODEN: YGKKAE; ISSN: 0037-9980
PB Yuki Gosei Kagaku Kyokai
DT Journal; General Review
LA Japanese
CC 21-0 (General Organic Chemistry)
Section cross-reference(s): **67**

AB A review with 54 refs. The **Lewis acid**-mediated reactions of imines are one of the most powerful methods for preparation of nitrogen-containing compds. However, there are few examples of the reactions using **catalytic** amts. of **Lewis acids**, because the strong coordination of the products (which are mostly secondly or tertiary amines), deactivates the acids. This article introduces several types of new achiral and chiral **Lewis acids** which can mediate the reactions of imines **catalytically.** The essence of the **catalytic** activation of imines by **Lewis acids** is the equilibrium between **Lewis acids** and bases (imines or products), and it has been revealed that rare earth triflates (**lanthanide** and scandium **trifluoromethanesulfonate**) are excellent **catalyst** for this purpose. Imino-aldol reactions, aza Diels-Alder reactions, allylation reactions, cyanation reactions, and 3-component reactions of aldehydes, amines, and nucleophiles were successfully carried out in the presence of **catalytic** amts. of rare earth triflates. **Polymer-supported** reagents also worked well by using the triflates as **catalysts**. In addition, it was shown that group IV triflates (Zr and Hf triflates) were effective for **catalytic** activation of imines. The 1st truly **catalytic** asym. reactions of imines have been achieved using new chiral **Lewis acids**. In the presence of a **catalytic** amount of a chiral rare earth **catalyst**, imines derived from 2-aminophenol and aldehydes reacted with cyclopentadiene or vinyl ethers to afford 8-hydroxytetrahydroquinoline derivs. in high yields with high diastereo- and enantioselectivities. Moreover, the 1st **catalytic** enantioselective Mannich-type reactions of imines with silyl enolates using a novel chiral zirconium **catalyst** have been developed. High levels of enantioselectivities in the synthesis of chiral β-amino ester derivs. β-amino alc. derivs., and tetrahydropyridine derivs. have been achieved using these reactions.
ST review imine **catalytic** activation **Lewis acid** ; **lanthanide** triflate **catalyst** imine activation review
IT Asymmetric synthesis and induction
Stereochemistry

(**catalytic** activation of imines using novel **Lewis acids**)
IT **Lewis acids**
RL: **CAT (Catalyst use)**; USES (Uses)
(**catalytic** activation of imines using novel **Lewis acids**)
IT Imines
RL: RCT (Reactant); RACT (Reactant or reagent)
(**catalytic** activation of imines using novel **Lewis acids**)
IT **Catalysts**
(stereoselective; **catalytic** activation of imines using novel **Lewis acids**)
IT Rare earth salts
RL: CAT (Catalyst use); USES (Uses)
(triflates; **catalytic** activation of imines using novel **Lewis acids**)
IT 1493-13-6D, rare earth salts
RL: CAT (Catalyst use); USES (Uses)
(**catalytic** activation of imines using novel **Lewis acids**)

L81 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1998:271295 HCAPLUS
DN 129:53922
ED Entered STN: 13 May 1998
TI A microencapsulated **lewis acid.** A new type of **polymer-supported lewis acid catalyst** of wide utility in organic synthesis
AU **Kobayashi, Shu**; Nagayama, Satoshi
CS Dep. Appl. Chem., Fac. Sci., Sci. Univ. Tokyo (SUT), Tokyo, 162, Japan
SO Journal of the American Chemical Society (1998), 120(12), 2985-2986
CODEN: JACSAT; ISSN: 0002-7863
PB American Chemical Society
DT Journal
LA English
CC 21-2 (General Organic Chemistry)
OS CASREACT 129:53922
AB Microencapsulated scandium (III) triflate [Sc(OTf)3] is prepared and used as a recyclable, **polymer-supported Lewis acid catalyst** with higher activity than unencapsulated Sc(OTf)3. Polystyrene-encapsulated Sc(OTf)3 was used as a **catalyst** for imino aldol, Mannich, aldol, and Michael reactions, in addition to Friedel-Crafts acylations, Strecker reactions, cyanohydrin formation, allylation, and Diels-Alder and aza-Diels-Alder cycloaddns. Microencapsulated Sc(OTf)3 can be recycled by filtration; the **catalyst** showed no loss of activity upon reuse.
ST microencapsulated scandium triflate polystyrene prepn **catalyst**; imino aldol Mannich Michael reaction **catalyst**; Friedel Crafts acylation Strecker reaction **catalyst**; allylation cyanohydrin formation **catalyst**; aza Diels Alder cycloaddn **catalyst**; **polymer supported** recyclable **Lewis acid catalyst**; encapsulated **catalyst** activity unencapsulated **catalyst**
IT Condensation reaction **catalysts**
Condensation reaction **catalysts**
(Mannich reaction **catalysts**; preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst**)
IT Diels-Alder reaction **catalysts**
(aza; preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst**)
IT Mannich reaction

Mannich reaction
(**catalysts**; preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst**)

IT Aldol condensation **catalysts**
(imino; preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst**)

IT Aldol condensation **catalysts**
Allylation **catalysts**
Diels-Alder reaction **catalysts**
Friedel-Crafts reaction **catalysts**
Hydrocyanation **catalysts**
Michael reaction **catalysts**
Microcapsules
Polymer-supported reagents
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst**)

IT **Lewis acids**
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst**)

IT 144026-79-9DP, Scandium triflate, microencapsulated
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst**)

IT 62-53-3, Benzenamine, reactions 94-41-7, Chalcone 100-52-7, Benzaldehyde, reactions 100-66-3, Anisole, reactions 538-51-2, N-Benzylideneaniline 542-92-7, 1,3-Cyclopentadiene, reactions 1191-99-7, 2,3-Dihydrofuran 2043-21-2 2043-61-0, Cyclohexanecarboxaldehyde 7393-43-3, Tetraallyltin 7677-24-9, Cyanotrimethylsilane **9003-53-6**, Polystyrene 31469-16-6, 1-Ethoxy-2-methyl-1-trimethylsiloxy-1-propene 66323-99-7, (Z)-1-Phenyl-1-trimethylsiloxypropene 144026-79-9, Scandium triflate
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst**)

IT 100-06-1P 743-93-1P 936-58-3P 4354-47-6P 4553-59-7P 35022-33-4P 58649-05-1P 66489-79-0P 151282-51-8P 208757-07-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst**)

RE.CNT 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD

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IT **9003-53-6**, Polystyrene
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst**)
RN 9003-53-6 HCAPLUS
CN Benzene, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

L81 ANSWER 12 OF 14 HCAPLUS
AN 1998:270039 HCAPLUS
DN 129:244686
ED Entered STN: 13 May 1998
TI A Microencapsulated **Lewis Acid**. A New Type of **Polymer-Supported Lewis Acid Catalyst** of Wide Utility in Organic Synthesis. [Erratum to document cited in CA129:53922]
AU **Kobayashi, Shu**; Nagayama, Satoshi
CS Dep. Appl. Chem., Fac. Sci., Sci. Univ. Tokyo (SUT), Tokyo, 162, Japan
SO Journal of the American Chemical Society (1998), 120(18), 4554
CODEN: JACSAT; ISSN: 0002-7863
PB American Chemical Society
DT Journal
LA English
CC 21-2 (General Organic Chemistry)
AB A corrected Scheme 3 is given.
ST erratum microencapsulated scandium triflate polystyrene prepn; microencapsulated scandium triflate polystyrene prepn erratum; scandium triflate polystyrene prepn **catalyst** erratum; imino aldol Mannich Michael reaction erratum; aldol Mannich Michael reaction **catalyst** erratum; Friedel Crafts acylation Strecker reaction erratum; Crafts acylation Strecker reaction **catalyst** erratum; allylation cyanohydrin formation **catalyst** erratum; aza Diels Alder cycloaddn **catalyst** erratum; **polymer supported** recyclable **Lewis acid** erratum; **supported** recyclable **Lewis acid catalyst** erratum; encapsulated **catalyst** activity unencapsulated **catalyst**

erratum
IT Condensation reaction **catalysts**
Condensation reaction **catalysts**
(Mannich reaction **catalysts**; preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst** (Erratum))
IT Diels-Alder reaction **catalysts**
(aza; preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst** (Erratum))
IT Mannich reaction
Mannich reaction
(**catalysts**; preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst** (Erratum))
IT Aldol condensation **catalysts**
Allylation **catalysts**
Friedel-Crafts reaction **catalysts**
Hydrocyanation **catalysts**
Michael reaction **catalysts**
Microcapsules
Polymer-supported reagents
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst** (Erratum))
IT **Lewis acids**
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst** (Erratum))
IT 144026-79-9DP, Scandium triflate, microencapsulated
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst** (Erratum))
IT 62-53-3, Aniline, reactions 94-41-7, Chalcone 100-52-7, Benzaldehyde, reactions 100-66-3, Anisole, reactions 538-51-2, N-Benzylideneaniline 542-92-7, 1,3-Cyclopentadiene, reactions 1191-99-7, 2,3-Dihydrofuran 2043-21-2 2043-61-0, Cyclohexanecarboxaldehyde 7393-43-3, Tetraallyltin 7677-24-9, Cyanotrimethylsilane **9003-53-6**, Polystyrene 31469-16-6, 1-Ethoxy-2-methyl-1-trimethylsiloxy-1-propene 66323-99-7 144026-79-9, Scandium triflate
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst** (Erratum))
IT 100-06-1P 743-93-1P 936-58-3P 4354-47-6P 4553-59-7P 35022-33-4P 58649-05-1P 66489-79-0P 151282-51-8P 208757-07-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst** (Erratum))
IT **9003-53-6**, Polystyrene
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of a polystyrene-microencapsulated **Lewis acid** as a recyclable **catalyst** (Erratum))
RN 9003-53-6 HCAPLUS
CN Benzene, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 100-42-5
CMF C8 H8

$H_2C=CH-Ph$

L81 ANSWER 13 OF 14 HCAPLUS
AN **1998:79431** HCAPLUS
DN **128:197244**
ED Entered STN: 11 Feb 1998
TI Supported **Lewis acid catalyst**
IN Kobayashi, Osamu
PA Kobayashi, Osamu, Japan
SO Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM B01J023-10
ICS B01J031-12; C07B061-00; C07C221-00; C07C225-16; C07D211-86; C07D213-08; C07D221-16; C07D221-18; C07D491-048
CC 67-1 (**Catalysis**, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 23
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10024234	A2	19980127	JP 1997-53618	19970307
	JP 3197836	B2	20010813		
PRAI	JP 1996-52166	A	19960308		

AB Supported **Lewis acid catalysts** for the **catalytic** synthesis of quinolines, pyrimidines, β-aminoketones and homo allyl alcs., are prepared by immobilizing **Lewis acid catalysts** containing rare earth elements as **catalytic** active centers into polyvinyl containing amino side chain groups. The preparation of supported **Lewis acid catalyst** includes the reaction of a **polymer** and a **Lewis acid**, typically polyallylamine and scandium trifluoromethane **sulfonate.**
ST **polymer** supported **Lewis acid catalyst**; polyallylamine scandium trifluoromethane **sulfonate Lewis acid**; rare earth element **Lewis acid catalyst**
IT Alcohols, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(allyl; **catalytic** synthesis by **polymer** supported **Lewis acid catalyst**)
IT **Catalysts**
(**catalytic** synthesis by **polymer supported Lewis acid catalyst**)
IT Mannich bases
RL: SPN (Synthetic preparation); PREP (Preparation)
(**catalytic** synthesis by **polymer** supported **Lewis acid catalyst**)
IT Ethers, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(enol, silyl; **catalytic** synthesis of β-aminoketon derivs. by **polymer** supported **Lewis acid catalyst**)
IT **Lewis acids**
Rare earth **metals**, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(**polymer** supported **Lewis acid catalyst**)
IT 59414-23-2, 4-Methoxy-2-trimethylsiloxy-1,3-butadiene
RL: RCT (Reactant); RACT (Reactant or reagent)
(**catalytic** synthesis of pyridine derivs. by **polymer** supported **Lewis acid catalyst**)

IT 84307-76-6P
RL: SPN (Synthetic preparation); PREP (Preparation)
(**catalytic** synthesis of pyridine derivs. by **polymer** supported **Lewis acid catalyst**)
IT 62-53-3, Aniline, reactions 100-52-7, Benzaldehyde, reactions 106-47-8, P-Chloroaniline, reactions 542-92-7, Cyclopentadiene, reactions 1074-12-0, Phenylglyoxal 29036-25-7, Methylindene
RL: RCT (Reactant); RACT (Reactant or reagent)
(**catalytic** synthesis of quinoline derivs. by **polymer** supported **Lewis acid catalyst**)
IT 123166-90-5P 172824-27-0P 184226-23-1P
RL: SPN (Synthetic preparation); PREP (Preparation)
(**catalytic** synthesis of quinoline derivs. by **polymer** supported **Lewis acid catalyst**)
IT 743-93-1P
RL: SPN (Synthetic preparation); PREP (Preparation)
(**catalytic** synthesis of β-aminoketon derivs. by **polymer** supported **Lewis acid catalyst**)
IT 358-23-6D, Trifluoromethane sulfonic anhydride, reaction product with amine derivative of poly(acrylonitrile) and scandium trifluoromethane **sulfonate** 25014-41-9D, Poly(acrylonitrile), amine derivs., reaction product with trifluoromethane sulfonic anhydride and scandium trifluoromethane **sulfonate** 144026-79-9D, reaction product with amine derivative of poly(acrylonitrile) and trifluoromethane sulfonic anhydride
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(preparation of **polymer** supported **Lewis acid catalyst**)

L81 ANSWER 14 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
AN **1986:514471** HCAPLUS
DN **105:114471**
ED Entered STN: 03 Oct 1986
TI Paraffin isomerization catalyzed by **polymer**-supported superacids
AU Dooley, K. M.; Gates, B. C.
CS Cent. Catal. Sci. Technol., Univ. Delaware, Newark, DE, 19716, USA
SO Journal of Catalysis (1985), 96(2), 347-56
CODEN: JCTLA5; ISSN: 0021-9517
DT Journal
LA English
CC 22-7 (Physical Organic Chemistry)
AB Solid superacids were prepared by the reaction of **metal**-halide **Lewis acids** with macroporous **sulfonated** poly(styrene-divinylbenzene), and a supported trifluoromethanesulfonic acid was prepared on the **unsulfonated** support. These **polymers** were used to **catalyze** the isomerization and dehydrogenation of n-butane in a flow reactor at 60-120° and 0.54 bar butane partial pressure. The **catalysts** were active in the presence of small amts. of HCl co-**catalyst** (the reaction rates being about 2 + 10-9 mol/g s for the most active **catalysts**), but rapid deactivation resulted from loss of hydrogen halide. **Catalysts** prepared from $SnCl_4$ and $TiCl_4$ were relatively inactive in comparison with those prepared from SbF_5 and BF_3; the **catalysts** prepared from $AlCl_3$ were as active as those containing fluorine and more stable.
The activities of the **catalysts** are compared to the acid strengths of unsupported conjugate **Lewis-acid** analogs indicated by the Hammett acidity function.
ST butane isomerization hydrogenation; superacid catalyst **polymer** supported
IT **Lewis acids**

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      RL: PRP (Properties)
         (polymer supported catalysts, containing hydrogen
         chloride, for isomerization and dehydrogenation of butane)
IT    Dehydrogenation catalysts
      Isomerization catalysts
         (polymer-supported superacids, for butane)
IT    Polymer-supported reagents
         (superacids, catalysts, for dehydrogenation and isomerization of
         butane)
IT    7647-01-0D, polymer supported
      RL: CAT (Catalyst use); USES (Uses)
         (Lewis catalysts containing, for isomerization and dehydrogenation of
         butane)
IT    1493-13-6D, polymer-supported   7446-70-0D, polymer
      -supported, uses and miscellaneous   7550-45-0D, polymer
      -supported   7637-07-2D, polymer-supported   7646-78-8D,
      polymer-supported   7783-70-2D, polymer-supported
      RL: CAT (Catalyst use); USES (Uses)
         (catalysts, containing hydrogen chloride, for isomerization and
         dehydrogenation of butane)
IT    106-97-8, reactions
      RL: RCT (Reactant); RACT (Reactant or reagent)
         (isomerization and dehydrogenation of, catalysts for)


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FILE LAST UPDATED: 13 JAN 2004       <20040113/UP>
PATENTS CITATION INDEX, COVERS 1973 TO DATE

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L104 ANSWER 1 OF 1  DPCI  COPYRIGHT 2004 THOMSON DERWENT on STN
AN    2001-432541 [46]   DPCI
DNC   C2001-130816
TI    Polymer supported Lewis acid catalyst comprises Lewis acid group of
      specified formula, with high activity in reactions in aqueous medium.
DC    A97 J04
IN    KOBAYASHI, S
PA    (KAGA-N) KAGAKU GIJUTSU SHINKO JIGYODAN; (NISC-N) JAPAN SCI & TECHNOLOGY
      CORP
CYC   21
PI    WO 2001036095 A1 20010525 (200146)* JA   18p    B01J031-06
         RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
          W: US
      JP 2001137710 A  20010522 (200146)        8p    B01J031-26
      EP 1184076    A1 20020306 (200224)  EN          B01J031-06
          R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
      JP 3389176    B2 20030324 (200323)        7p    B01J031-06
ADT   WO 2001036095 A1 WO 2000-JP7386 20001023; JP 2001137710 A
      JP 1999-327424 19991117; EP 1184076 A1 EP 2000-969995 20001023,
      WO 2000-JP7386 20001023; JP 3389176 B2 JP 1999-327424
      19991117
FDT   EP 1184076 A1 Based on WO 2001036095; JP 3389176 B2 Previous Publ. JP
      2001137710
PRAI  JP 1999-327424     19991117
IC    ICM  B01J031-06; B01J031-26
      ICS  B01J031-12; B01J031-14; B01J031-16; B01J031-34; B01J031-36;
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        B01J031-38; C07B037-02; C07C029-40; C07C033-025; C07C033-30;
        C07C045-64; C07C049-835; C07C067-31; C07C069-732; C07C253-00;
        C07C255-42; C07C327-22
ICA  C07B061-00; C07D263-10
FS   CPI

EXF  EXAMINER'S FIELD OF SEARCH    UPE: 20030827
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CTCS CITATION COUNTERS
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PNC.DI    0            Cited Patents Count (by inventor)
PNC.DX    6            Cited Patents Count (by examiner)
IAC.DI    0            Cited Issuing Authority Count (by inventor)
IAC.DX    1            Cited Issuing Authority Count (by examiner)

PNC.GI    0            Citing Patents Count (by inventor)
PNC.GX    0            Citing Patents Count (by examiner)
IAC.GI    0            Citing Issuing Authority Count (by inventor)
IAC.GX    0            Citing Issuing Authority Count (by examiner)

CRC.I     0            Cited Literature References Count (by inventor)
CRC.X     0            Cited Literature References Count (by examiner)

CDP  CITED PATENTS        UPD: 20030827
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     Cited by Examiner
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     CITING PATENT    CAT    CITED PATENT      ACCNO
     -------------------------------------------------------
     JP 3389176     B2        JP 1024234     A
                              JP 99327424    A
     WO 200136095   A  A      JP 9262479     A  1997-544509/50
                    PA:    (KURS) KURARAY CO LTD
                       A      JP 10024234    A  1998-153094/14
                    PA:    (KOBA-I) KOBAYASHI O
                       A      JP 10230166    A  1998-524527/45
                    PA:    (ASAH) ASAHI KASEI KOGYO KK; (NOGK) ZH NOGUCHI
                           KENKYUSHO
                       A      JP 11244705    A  1999-565042/48
                    PA:    (KAGA-N) KAGAKU GIJUTSU SHINKO JIGYODAN


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L108 ANSWER 1 OF 2  HCAPLUS  COPYRIGHT 2004 ACS on STN
AN   1999:582903  HCAPLUS
DN   131:234117
ED   Entered STN:  16 Sep 1999
TI   Surface active Lewis acid catalyst
IN   Kobayashi, Osamu; Oyamada, Hidekazu
PA   Foundation for Scientific Technology Promotion, Japan
SO   Jpn. Kokai Tokkyo Koho, 6 pp.
     CODEN: JKXXAF
DT   Patent
LA   Japanese
IC   ICM  B01J031-26
     ICS  C07C033-00; C07C045-71; C07C049-04; C07C049-213; C07C049-76;
          C07C069-00; C07C209-60; C07C227-22; C07G003-00; C07B061-00
CC   67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
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Section cross-reference(s): 45
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11244705	A2	19990914	JP 1998-53075	19980305 <--
PRAI	JP 1998-53075		19980305		

OS MARPAT 131:234117
AB The surface active Lewis acid catalyst is represented by Mn+(R1X-)k(R2X-)l(Y-)m [(k + l + m) = n; n≥1; 0≤k, l, m≤3; M = transition metal; X- = conjugated base of organic acid; R1 = C8-30 hydrocarbon; R2 = C1-12 hydrocarbon; and Y- = inorg. anion], in which at least a part of a hydrophobic group has a Lewis acid. This surface active Lewis acid catalyst provided a high yield in an organic synthetic reaction in an aqueous medium.
ST surface active Lewis acid catalyst
IT Catalysts
(surface active Lewis acid catalyst)
IT 100-52-7, Benzaldehyde, reactions 66323-99-7, (Z)-1-Phenyl-1-trimethylsiloxypropene
RL: RCT (Reactant); RACT (Reactant or reagent)
(addition reaction by surface active Lewis acid catalyst)
IT 61878-73-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(addition reaction by surface active Lewis acid catalyst)
IT 211638-08-3 211638-09-4 211638-10-7 211638-11-8 211638-13-0
211638-14-1 211638-15-2 211638-16-3 211638-17-4 243847-32-7
243847-38-3 243847-40-7
RL: CAT (Catalyst use); USES (Uses)
(surface active Lewis acid catalyst)
IT 211638-03-8P
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(surface active Lewis acid catalyst)
IT 151-21-3, Sodium dodecylsulfate, reactions 10361-84-9, Scandium chloride
RL: RCT (Reactant); RACT (Reactant or reagent)
(surface active Lewis acid catalyst)

L108 ANSWER 2 OF 2 HCAPLUS
AN 1998:580100 HCAPLUS
DN 129:244868
ED Entered STN: 11 Sep 1998
TI Catalysts containing fixed bis(perfluoroalkylsulfonyl)imide metal salts for esterification of acetic acid
IN Furuya, Masahiko; Nakajima, Hitoshi
PA Asahi Chemical Industry Co., Ltd., Japan; Noguchi Research Institute
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM B01J031-12
ICS C07B061-00; C07C067-08; C07C069-14
CC 23-17 (Aliphatic Compounds)
Section cross-reference(s): 67
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10230166	A2	19980902	JP 1997-51105	19970220 <--
PRAI	JP 1997-51105		19970220		

OS MARPAT 129:244868
AB Metal oxide porous catalysts contain 0.1-50 weight% [(RfSO2)2N]nM (Rf = C1-8 perfluoroalkyl; M = alkaline earth metal, transition metal, B, Al, Ga, In, Tl, Si, Ge, Sn, Pb, As, Sb, Bi, Te; n = valence of M). A H2O solution of 3 g bis(perfluorooctanesulfonyl)imide (preparation given) was treated with 0.39 g

Yb oxide at 60° for 1 h to give 2.9 g ytterbium tris[bis(perfluorooctanesulfonyl)imide] (I). AcOH was esterified with EtOH in the presence of silica gel containing 5.4 weight% I at 50° for 7 h to give 64% AcOEt.

ST fluoroalkylsulfonylimide metal salt fixed catalyst; acetic acid esterification ytterbium fluorobutanesulfonylimide catalyst

IT Ultrastable Y zeolites
RL: CAT (Catalyst use); USES (Uses)
(HY, HSZ 330HUA, catalyst support; catalysts containing fixed bisperfluoroalkylsulfonylimide metal salts for esterification of acetic acid)

IT Silica gel, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst support; catalysts containing fixed bisperfluoroalkylsulfonylimide metal salts for esterification of acetic acid)

IT Esterification catalysts
(catalysts containing fixed bisperfluoroalkylsulfonylimide metal salts for esterification of acetic acid)

IT Zeolite HY
RL: CAT (Catalyst use); USES (Uses)
(ultrastable, HSZ 330HUA, catalyst support; catalysts containing fixed bisperfluoroalkylsulfonylimide metal salts for esterification of acetic acid)

IT 7631-86-9, Silica, uses
RL: CAT (Catalyst use); USES (Uses)
(alumina and, mesopore, catalyst support; catalysts containing fixed bisperfluoroalkylsulfonylimide metal salts for esterification of acetic acid)

IT 176726-07-1P 192888-06-5P, Ytterbium tris[bis(perfluorobutanesulfonyl)imide] 192888-09-8P, Ytterbium tris[bis(perfluorooctanesulfonyl)imide] 192888-10-1P, Bis(perfluorooctanesulfonyl)imide, yttrium salt
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(catalysts containing fixed bisperfluoroalkylsulfonylimide metal salts for esterification of acetic acid)

IT 307-35-7, Perfluorooctanesulfonyl fluoride 335-05-7, Trifluoromethanesulfonyl fluoride 375-72-4, Perfluorobutanesulfonyl fluoride 1070-89-9, Bistrimethylsilylamide, sodium salt
RL: RCT (Reactant); RACT (Reactant or reagent)
(catalysts containing fixed bisperfluoroalkylsulfonylimide metal salts for esterification of acetic acid)

IT 39847-39-7P, Bisperfluorobutanesulfonylimide 39847-41-1P, Bis(perfluorooctane)sulfonylimide 39847-42-2P, N-Trimethylsilylperfluorobutanesulfonylamide, sodium salt 91742-21-1P, Bis(trifluoromethanesulfonyl)imide, sodium salt 129135-86-0P, Bisperfluorobutanesulfonylimide, sodium salt 192767-89-8P, Bisperfluorooctanesulfonylimide, sodium salt 192767-90-1P, N-Trimethylsilylperfluorooctanesulfonylamide, sodium salt
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(catalysts containing fixed bisperfluoroalkylsulfonylimide metal salts for esterification of acetic acid)

IT 141-78-6P, Ethyl acetate, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(catalysts containing fixed bisperfluoroalkylsulfonylimide metal salts for esterification of acetic acid)

IT 1344-28-1, Alumina, uses
RL: CAT (Catalyst use); USES (Uses)
(silica and, mesopore, catalyst support; catalysts containing fixed bisperfluoroalkylsulfonylimide metal salts for esterification of acetic acid)

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     (FILE 'HOME' ENTERED AT 13:22:12 ON 14 JAN 2004)
                SET COST OFF

     FILE 'HCAPLUS' ENTERED AT 13:22:26 ON 14 JAN 2004
L1          21509 S LEWIS ACID
L2          10765 S L1 (L) CATALY?
                  E LEWIS ACID/CT
L3           2444 S E8 (L) CATALY?
L4           2999 S E8 (L) CAT/RL
                  E CATALYST/CT
L5            100 S E14 (L) LEWIS ACID
L6           2526 S L1 AND CATALY?/SC,SX
L7          11685 S L2-L6
                  E KOBAYASHI S/AU
L8              7 S E3,E4 AND L7
                  E KOBAYASHI SHU/AU
L9             99 S E3-E5 AND L7
L10           100 S KOBAYASHI SHU?/AU AND L7
L11             1 S (WO2000-JP7386 OR JP99-327424)/AP,PRN
L12           107 S L8-L10
L13            71 S L7 AND (SO3 OR SO4)
L14             0 S L12 AND L13
L15             1 S L11 AND L13
L16           331 S L7 AND (SULFATE OR SULPHATE OR SULFONATE OR SULPHONATE)
L17            10 S L12 AND L16
L18           323 S L7 AND (?SULFATE? OR ?SULPHATE? OR ?SULFONATE? OR ?SULPHONATE
L19            24 S L12 AND (?SULFATE? OR ?SULPHATE? OR ?SULFONATE? OR ?SULPHONAT
                  SEL DN AN 7 17
L20             2 S L19 AND E1-E4
L21             3 S L15,L20 AND L1-L20
L22           118 S L7 AND CARBON CARBON
L23           159 S L7 AND C C
L24           259 S L22,L23
L25            13 S L24 AND ?LANTHAN?
L26           294 S L7 AND ?LANTHAN?
L27            12 S L16,L18 AND L24
L28             2 S L16,L18 AND L25
L29            51 S L16,L18 AND L26
L30          3166 S L7 AND ?POLYM?
L31          2050 S L7 AND POLYM?/SC,SX
L32          3337 S L30,L31
L33            12 S L32 AND L13
L34           164 S L32 AND L16,L18
L35           168 S L33,L34
L36             1 S L35 AND L24
L37            17 S L35 AND ?LANTHAN?

     FILE 'REGISTRY' ENTERED AT 13:40:39 ON 14 JAN 2004
L38             1 S 10361-84-9

     FILE 'HCAPLUS' ENTERED AT 13:40:50 ON 14 JAN 2004
L39           434 S L38
L40           733 S SCCL3 OR SCANDIUM CHLORIDE
L41           849 S L39,L40
L42            30 S L41 AND L7
L43            69 S L41 AND ?POLYM?
L44            30 S L41 AND POLYM?/SC,SX
L45            74 S L43,L44
L46            13 S L45 AND (SO3 OR SO4 OR ?SULFATE? OR ?SULPHATE? OR ?SULPHONATE
L47             1 S L45 AND (C C OR CARBON CARBON)
L48            13 S L46 NOT L47
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L49            4 S L46 AND SUPPORT?

     FILE 'REGISTRY' ENTERED AT 13:45:44 ON 14 JAN 2004
L50            1 S 9003-70-7
L51            1 S 100-42-5
L52        66029 S 100-42-5/CRN
L53           17 S L52 AND 1/NC
L54           13 S L53 NOT RIS/CI
L55            3 S L54 AND HOMOPOLYMER

     FILE 'HCAPLUS' ENTERED AT 13:47:54 ON 14 JAN 2004
L56       158672 S L50,L51,L55
L57          352 S L56 AND L7
L58            2 S L57 AND L41
L59           26 S L57 AND L16,L18
L60            1 S L59 AND (C C OR CARBON CARBON)
L61            9 S L57 AND ?LANTHAN?
L62           33 S L58,L59,L60,L61
L63           64 S L12 AND L13-L37,L39-L49,L56-L62
L64            8 S L63 AND ?SUPPORT?
L65            8 S L63 AND ?POLYM?
L66            8 S L64,L65
L67            7 S L66 NOT ENOL/TI
L68           56 S L63 NOT L66
                 SEL DN AN L68 14 22 27 29
L69            4 S L68 AND E5-E16
L70           12 S L67,L69,L15
                 E POLYMER SUPPORT/CT
                 E POLYMER-SUPPORT/CT
                 E E5+ALL
L71          249 S E2
                 E POLYMER-SUPPORT/CT
                 E E7+ALL
L72         2842 S E4
L73           53 S L71,L72 AND L7
L74           14 S L73 AND ?METAL?
L75            1 S L73 AND ?LANTHAN?
                 SEL DN AN L74 3 7 9 11 13 14
L76            6 S L74 AND E1-E18
L77           17 S L70,L76
L78            6 S L77 AND (SO3 OR SO4 OR ?SULFATE? OR ?SULPHATE? OR ?SULPHONATE
L79           14 S L70,L78
L80            7 S L12 AND L41
L81           14 S L79 AND L1-L37,L39-L49,L56-80

     FILE 'HCAPLUS' ENTERED AT 14:18:11 ON 14 JAN 2004

     FILE 'WPIX' ENTERED AT 14:18:30 ON 14 JAN 2004
L82            1 S L11
L83          785 S B01J031-06/IC,ICM,ICS
L84           12 S L83 AND B01J031-3?/IC,ICM,ICS
L85           18 S L83 AND B01J031-12/IC,ICM,ICS
L86           13 S L83 AND B01J031-26/IC,ICM,ICS
L87           38 S L84-L86
L88            1 S L87 AND C07C049-835/IC,ICM,ICS
L89            3 S L87 AND C07B037/IC,ICM,ICS
L90            3 S L87 AND C07C049/IC,ICM,ICS
L91           20 S L87 AND C07C/IC,ICM,ICS
L92            4 S L88-L90
L93        21008 S B01J031/IC,ICM,ICS
L94         1067 S L93 AND C07C049/IC,ICM,ICS
L95           21 S L94 AND L83
L96           40 S L94 AND LEWIS/BIX
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L97            4 S L95 AND L96
L98           13 S L94 AND (SO3 OR SO4)/BIX
L99            2 S L96 AND L98
L100          89 S L94 AND (?SULFATE? OR ?SULPHATE? OR ?SULPHONATE? OR ?SULFONAT
L101         101 S L98,L100
L102           1 S L101 AND C07C049-835/IC,ICM,ICS
L103           3 S L94 AND C07C049-835/IC,ICM,ICS

     FILE 'DPCI' ENTERED AT 15:02:19 ON 14 JAN 2004
L104           1 S L11

     FILE 'DPCI' ENTERED AT 15:02:27 ON 14 JAN 2004

     FILE 'HCAPLUS' ENTERED AT 15:03:26 ON 14 JAN 2004
L105           4 S (JP3389176 OR WO200136095 OR JP1024234 OR JP99327424 OR JP926
L106           2 S (JP2001-24234 OR JP99-327424 OR JP92-62479)/AP,PRN
L107           3 S L105,L106 NOT L81
L108           2 S L107 NOT APPARATUS/TI

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